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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/740,016

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Shi-Tron Lin

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4271

22852

7590

09/30/2002

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EXAMINER

NADAV, ORI

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 09/30/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/740,016

Applicant(s)

LIN ET AL.

Examiner

ori nadav

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-118, 121 and 122 is/are pending in the application.
- 4a) Of the above claim(s) 1-82 and 93-95 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 83-88 and 96-116 is/are allowed.
- 6) ☒ Claim(s) 89-91, 117, 118, 121 and 122 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Art Unit: 2811

DETAILED ACTION

Drawings

1. *The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, each segment being closer to the channel than to the contact region, as recited in claim 121, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.*

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

3. Claims 89, 91 and 121-122 are rejected under 35 U.S.C. 102(e) as being anticipated by Hsu et al. (6,236,073).

Art Unit: 2811

Regarding claims 91, 121 and 122, Hsu et al. teach in figure 5 an electrostatic discharge protection device, comprising: a substrate 120 (figure 4); a first diffusion region 122 formed in the substrate; a second diffusion region 124 formed in the substrate adjacent to and spaced from the first diffusion region; plurality of contacts contact 130 for making a conductive connection to the first diffusion region; a channel (the area under gate 126) formed in a third region between the first and second diffusion regions; and a plurality of current divider segments 140 unevenly distributed within the first diffusion region, wherein the different shapes are selected from a square, a circle, a cross shape, a T shape, a V shape, a U shape, and an L shape, and the plurality of segments includes a first row of segments; each one of the first row of segments has a center-of-area, the respective centers-of-area being one of aligned or not aligned, wherein the plurality of segments are formed of polysilicon segments, field oxide segments, or a combination of polysilicon and field oxide segments, and wherein the segments include a first segment spaced apart by a first gap from an adjacent second segment; the segments further include a third segment spaced apart by a second gap from an adjacent fourth segment; and the first gap being larger than the second gap, wherein the second segment is the third segment, a dielectric layer 125 formed over the channel, a conductive element 126 formed over the dielectric layer, wherein the conductive element is a polysilicon gate element; and the dielectric layer is

Art Unit: 2811

an oxide layer, wherein at least one of the segments is positioned between the at least one contact and the channel.

Regarding the claimed limitation of plurality of current divider segments, wherein each of the segments being closer to the channel than to the contact region, Hsu et al. teach at least two current divider segments being closer to the channel than to the contact region. The two current divider segments are plurality of current divider segments. Therefore, Hsu et al. teach plurality of current divider segments, wherein each of the segments being closer to the channel than to the contact region, as claimed.

Regarding claim 89, Hsu et al. teach a plurality of current divider segments 140 evenly and unevenly distributed within the first diffusion region and having a first portion oriented at an angle to the channel region.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2811

5. Claims 89-91, 117-118 and 121-122 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (5,721,439)

Regarding claims 89, 91 and 121-122, Lin teaches in figure 8 an electrostatic discharge protection device, comprising: a substrate; a first diffusion region 87 formed in the substrate; a second diffusion region 88 formed in the substrate adjacent to and spaced from the first diffusion region; plurality of contacts contact 97 (figure 9) for making a conductive connection to the first diffusion region; a channel (the area under gate 80) formed in a third region between the first and second diffusion regions; and a plurality of current divider segments 84, 85, 86 unevenly distributed within the first diffusion region, wherein the different shapes are selected from a square, a circle, a cross shape, a T shape, a V shape, a U shape, and an L shape, and the plurality of segments includes a first row of segments; each one of the first row of segments has a center-of-area, the respective centers-of-area being one of aligned or not aligned, wherein the plurality of segments are formed of polysilicon segments, field oxide segments, or a combination of polysilicon and field oxide segments, and wherein the segments include a first segment spaced apart by a first gap from an adjacent second segment; the segments further include a third segment spaced apart by a second gap from an adjacent fourth segment; and the first gap being larger than the second gap, wherein the second segment is the third segment, a dielectric layer 125 formed over the channel, a conductive element 126 formed over the dielectric layer, wherein the

Art Unit: 2811

conductive element is a polysilicon gate element; and the dielectric layer is an oxide layer, wherein at least one of the segments is positioned between the at least one contact and the channel.

Regarding the claimed limitation of plurality of current divider segments, wherein each of the segments being closer to the channel than to the contact region, Hsu et al. teach at least two current divider segments being closer to the channel than to the contact region. The two current divider segments are plurality of current divider segments. Therefore, Hsu et al. teach plurality of current divider segments, wherein each of the segments being closer to the channel than to the contact region, as claimed.

Lin does not teach in figure 8 plurality of contacts. Lin teaches in figure 9 plurality of contacts. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use plurality of contacts in the device of figure 8 in order to operate the device. Note that the device would not operate without contacts.

Regarding claim 89, Lin teaches a plurality of current divider segments 140 evenly and unevenly distributed within the first diffusion region and having a first portion oriented at an angle to the channel region.

Art Unit: 2811

Regarding claims 90 and 117-118, Lin teaches substantially the entire claimed structure, as applied to claim 1 above, except stating that the largest dimension of each segment is less than or equal to substantially six times a length of the channel.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the largest dimension of each segment being less than or equal to substantially six times or 2.5 times a length of the channel in Lin's device, since it is within the skills of an artisan to adjust the dimension of each segment, subject to routine experimentation and optimization.

6. Claims 90 and 117-118 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu et al.

Regarding claims 90 and 117-118, Hsu et al. teach substantially the entire claimed structure, as applied to claim 1 above, except stating that the largest dimension of each segment is less than or equal to substantially six times a length of the channel.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the largest dimension of each segment being less than or equal to substantially six times or 2.5 times a length of the channel in Hsu et al.'s device, since it is within the skills of an artisan to adjust the dimension of each segment, subject to routine experimentation and optimization.

Art Unit: 2811

Allowable Subject Matter

7. Claims 83-88, 92 and 96-116 are allowed.

Reasons for allowance

8. The following is an examiner's statement of reasons for allowance:

Hsu et al. appear to be the closest prior art reference. Hsu et al. teach substantially the entire claimed structure as recited in claim 83, except plurality of current divider segments randomly distributed within the first diffusion region. Prior art do not teach or render obviousness the semiconductor structure, because the present invention discloses the advantages and superiority of randomly distributing the plurality of current divider segments within the first diffusion region.

Response to Arguments

9. Applicant argues that prior art does not teach plurality of current divider segments, wherein each of the segments being closer to the channel than to the contact region.

Hsu et al. and Lin teach at least two current divider segments being closer to the channel than to the contact region. The two current divider segments are plurality of current divider segments. Therefore, Hsu et al. and Lin teach plurality of current

Art Unit: 2811

divider segments, wherein each of the segments being closer to the channel than to the contact region, as claimed.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

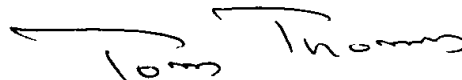
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Art Unit: 2811

Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to *Examiner Nadav* whose telephone number is **(703) 308-8138**. The Examiner is in the Office generally between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas, can be reached at **(703) 308-2772**.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **308-0956**

A handwritten signature in black ink that reads "Tom Thomas". The signature is written in a cursive style with a horizontal line above the name.

**TOM THOMAS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800**

Ori Nadav

September 26, 2002